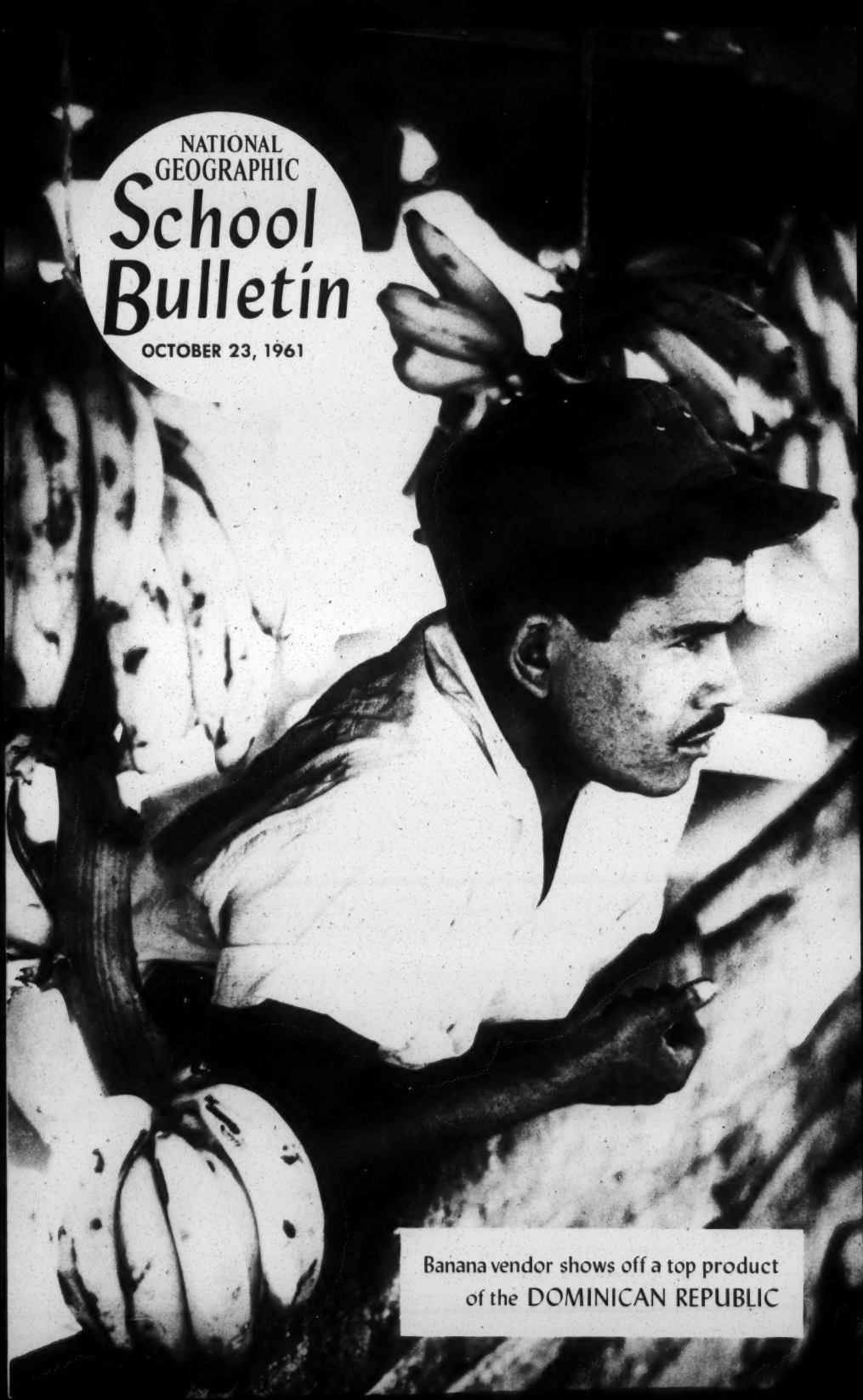
NATIONAL GEOGRAPHIC

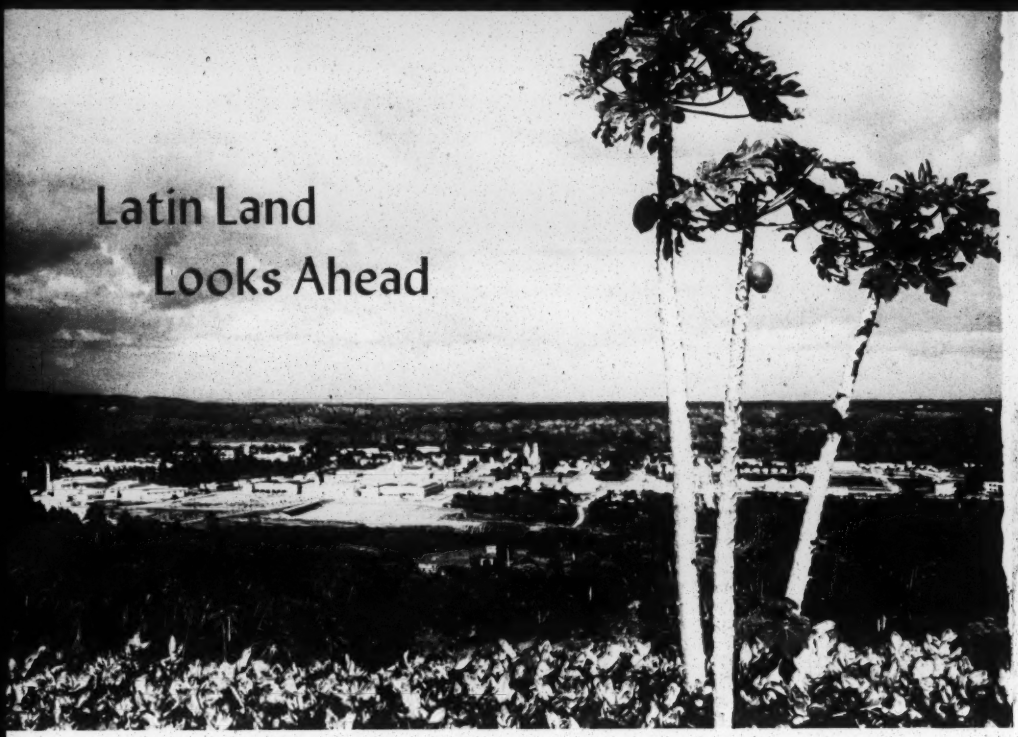
School Bulletin

OCTOBER 23, 1961



Banana vendor shows off a top product of the DOMINICAN REPUBLIC

Latin Land Looks Ahead



BEYOND papaya trees and sisal clumps lies San Cristóbal, a provincial capital

LET'S PLAY detective. Look at the picture at the top of the page. What part of the world is this?

The picture contains important clues. The tall bushy-topped trees grow in the tropics. Could this be somewhere in the Pacific?

Study the picture more closely. The church tower in the center looks Spanish.

If you could walk into the picture you would uncover another interesting clue. See the field in front of the city? It's a baseball diamond. Baseball is the favorite sport in this country.

The country is one of our closest neighbors: the Dominican Republic. The city in the picture is San Cristóbal, in the southern part of the Dominican Republic, not far from Ciudad Trujillo, the capital.

The Dominican Republic is in the West Indies. It is not a large country. Its area is only 18,816 square miles, and its population only 2,994,000.

Ciudad Trujillo is the only city with more than 100,000 people. It stands on the Caribbean coast in a beautiful spot where the Ozama River meets the sea.

Wooded hills rise toward three east-west mountain ranges that are clad with long-needled pines, mahogany, satinwood, and cedar. Rich soil fills valleys between the mountain ranges. It is so fertile that sugar cane, which is cut every year, grows back again and again from the same roots. Fence posts made out of green wood often take root and grow to full-sized trees.

Most of the people of the Dominican Republic live on farms

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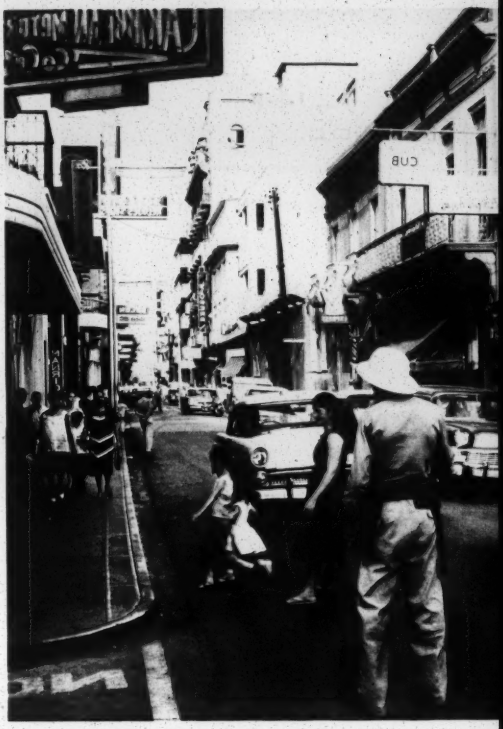
UMI

Illustrations by National Geographic Photographer Thomas Nebbia

or in small, spotlessly clean towns. Sugar is the biggest crop. The largest sugar mill in the world is in Haina, not far from Ciudad Trujillo. Bananas, cacao beans, coffee, tobacco, and rice are leading crops, and cattle raising is an important industry. Under the ground lie deposits of aluminum, nickel, and iron.

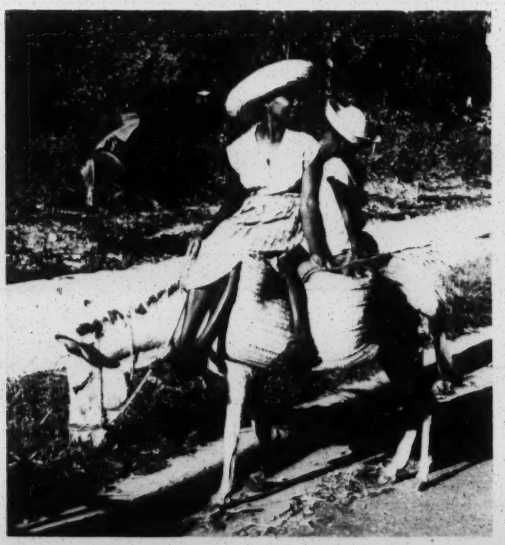
The country was settled by Spaniards and the Spanish influence is everywhere. Dominicans speak Spanish, and many of their customs and friendly traditions come from Spain.

Christopher Columbus came here on his first voyage to the New World, and left 44 Europeans behind to start a colony. When he returned the next year the colony was deserted and burned.



CIUDAD TRUJILLO, Dominican capital, is the country's largest city. It dates back to 1496, and was called Santo Domingo until 1936.

LOWLY BURRO is a favorite means of travel in rural areas of the country.



Before Columbus died he requested that he be buried in Santo Domingo (Ciudad Trujillo). His body was taken there after the cathedral was consecrated in 1541. Then in 1795 one of his heirs received permission to move his bones. A crumbling casket was hauled away to Havana, and in 1898 it was removed to Seville, Spain.

After the casket had been taken to Cuba, workmen repairing the old cathedral (it was the first in the Western Hemisphere) uncovered a coffin with a plate that was inscribed "Cristoval Colon," which means Christopher Columbus in Spanish.

SUGAR CANE CUTTER in a Dominican field chews on a sweet stalk. He uses a machete to cut the sugar cane.

Dominicans say that this was the real Columbus coffin, but Spaniards dispute the point. The evidence seems to support the Dominicans. On holidays or great state occasions they flock to the cathedral to kneel before the Columbus crypt, and the crypt is one of the first things that visitors want to see.

His brother, Bartolomé, succeeded where Columbus had failed. He established the first permanent European settlement of the Western Hemisphere, where Ciudad Trujillo now stands. It became Spain's capital in the western hemisphere, and many of the great expeditions of the proud conquistadors—Cortés, Balboa, Pizarro, De Soto, and Ponce de León—began at this thriving port.

Hispaniola is a land of storms. Many of the hurricanes that strike our eastern coast in the late summer or fall are born in this area.

The modern history of this land is one storm after another. Neighboring Haiti was settled by the French in the 1600's. France later ruled the whole island, but still later the Dominicans revolted. They won back their independence in 1844 and named the country the Dominican Republic.

From 1916 to 1924 the United States Marines occupied the Dominican Republic because of fighting inside the country.

DIVIDED ISLAND. Hispaniola lies in the West Indies, 800 miles southeast of Florida. The Dominican Republic occupies the east, while the rest is Haiti. Airlines, buses, and 3,000 miles of roads link the Dominican Republic's cities and rural centers. Dominicans spend pesos, go to Roman Catholic churches, and send their children to free public schools.

HAND-WOVEN baskets and pottery, displayed in a Ciudad Trujillo basket shop (right) are among the Dominican Republic's leading wares. Dominicans also make cigarettes, glassware, leather goods, peanut oil, soap, textiles, and cement. The big crop is sugar, which accounts for more than half of the country's exports. Workers like the one on the opposite page cut sugar cane stalks, and send them to the sugar mill to be reduced to crystals. Then the crystals go to the sugar refinery. The United States and the British Isles are principal markets for Dominican sugar.

In 1930, Rafael Leonidas Trujillo, a member of the Dominican guard, led a revolt that overthrew the government. He became the strong man of the Dominican Republic.

WORD OF THE WEEK

Ciu dad' (syo͞o-dăd') n. *The Spanish word for city. Ciudad Trujillo, capital of the Dominican Republic, means Trujillo City. How many ciudads can you find on the National Geographic map of Mexico and Central America or other Latin American maps?*

Trujillo helped his country in many ways, but he took away freedom. He gave his people a good water supply, public education, sanitation, roads, bridges, harbors, better crops, irrigation where it was needed, and public health services.

But he was a dictator who ruled with an iron hand. He threw thousands of people in jail, and left many of them there to die. Few Dominicans dared to oppose him. He put busts of himself in the parks, and plaques that praised him were hung in the shops. He changed the name of Santo Domingo to Ciudad Trujillo, and the highest mountain was named Pico Trujillo.

Early this year he was shot down by some of his enemies under a hail of machine gun bullets. When they killed him, he was in a car driving to San Cristóbal, the city that is shown in the picture at the beginning of our story. He had been born there 69 years earlier.

The dictator's son, Rafael Trujillo, Jr., took over after his father was killed. He promised to hold elections and give the people freedom. But so far he has not done so. And what will happen next in this stormy land only time will tell.

W.G.

North America's Grizzly Battles for Survival

ONE OF THE BRAVEST men who ever lived in America was Kit Carson. He was a scout, trapper, soldier, and Indian fighter who killed many an Indian and had many a close escape from death. President Theodore Roosevelt, who was a brave man himself, once said that of all the men who fought on the wild frontier, Kit Carson was "the best, the bravest."

In Wyoming one time Kit Carson spotted some elk on a ridge. He shot one, and was reloading his gun, when he heard a noise behind him. When he turned around and saw what it was, he started running and didn't stop until he was up a tree.

It probably was the only thing that ever made Kit Carson run. It showed that he was not only brave. He was smart. Charging down on Kit Carson were a pair of grizzly bears, among the mightiest and most dangerous animals on earth. The grizzly bear grows as much as nine feet tall and sometimes weighs 1,000 pounds. He gets his name from the color of his fur, which is brownish-yellow, gray, or reddish-brown, but white at the tips, giving him a gray or "grizzled" look. Early explorers often called him the "white bear" or "silvertip."

He has long, razor-sharp claws and powerful teeth, and can crush the skull of a bull with a single blow of the paw. His head and eyes are small, and he has a hump of muscle on his back, over his shoulders.

A huge grizzly bear guards her

Grizzlies normally will not attack unless they are attacked or startled, but when they come at you, you had better follow Kit Carson's example. "I do not like the gentlemen," said Meriwether Lewis, the great explorer who pioneered a path to the Pacific with William Clark. He added that he would rather "fight two Indians than one bear."

The grizzly lives in the mountains of western North America, where he has made his home for a million years. He feeds on tender shoots of many plants, insects, honey, livestock, animals, snails, and salmon and trout that

UMI

FRANK AND JOHN CRAIGHEAD

triplet cubs in Yellowstone National Park; the male bear shuns family life

he catches with his paws. He does not climb trees but he can scramble over mountains and run very fast when he has to.

He can sit upright with his hind legs extended out on the ground, but he usually travels on all fours. The grizzly rarely hibernates. He sleeps under dense foliage, in the open bases of huge trees, or in caves or dens that he digs in the ground.

Grizzlies used to roam the continent in vast numbers, but fewer than 1000 remain south of Canada. Hunters slaughtered many of them, ranchers had no love for them, and farms and cities occupied spaces where much of their food used to grow. Their litters are small and infrequent. The female does not have young until the third or fourth year and then only every other year, it is thought. Cubs arrive in pairs, sometimes in ones or threes, but rarely in fours.

The National Geographic Society has joined in an effort to save the grizzly.

Until recently it was impossible to get close to a grizzly. Biologists Frank and John Craighead told in the August 1960 *National Geographic* how they have overcome that problem. They shoot darts into the bears. The darts are injected with a powerful drug. The drug does not harm the bears, but it gives the scientists a chance to study them and perhaps to save one of North America's oldest citizens from extinction. W.G.

PEARL FARMING

KAZUKO is only 12 years old, but already she has begun to prepare for a career. She is training to join the corps of *ama,* or divers. Like the girl in the picture at right, she will work in one of Japan's most famous and profitable industries: pearl farming.

Kazuko inherits her life work from her mother, who, in turn, inherited it from *her* mother. Japanese pearl farmers employ women divers because they are more careful and dependable.

The heart of the industry beats in Ago Bay, off southern Honshū. A common sight here is a group of girls in white diving costumes putting out in a small boat.

When they reach a point above the oyster beds they toss big wooden tubs overboard, pull glass masks over their faces, and dive beneath the water. Thirty or 40 seconds later, they bob to the surface and throw their catch in the wooden tubs. The catch: a handful of three-year-old oysters. What happens next is the basis of pearl farming. The oysters are "seeded" and put back underwater where, with proper care, they will produce pearls.

JAPANESE diver brings oysters from the sea bottom

GILBERT M. GROSVENOR (ABOVE), AND W. ROBERT MOORE, NGS STAFF

HARDWORKING oyster yields the single pearl it took four years to form. This gem is not perfect. A seam along one side mars its beauty. Only one in 20 cultured pearls is a high-quality perfect sphere, but many can be used in necklaces. This pearl came from beds off the Ise Peninsula, on southern Honshū, Japan's main island.

UMI

Oysters develop pearls naturally. A parasite or some other object lodges inside the oyster shell and annoys the animal. The oyster coats the irritant with a limey secretion called nacre, and in time a lustrous pearl is formed.

But finding an oyster with a pearl is like finding a needle in a haystack. Only one in several thousand oysters grows a gem.

So the ingenious Japanese discovered a way to grow "cultured" pearls by making oysters manufacture the gems.

The credit belongs to a noodle vendor, the late Kokichi Mikimoto. He came from a fishing village in southern Honshū. He was occasionally lucky enough to find oysters containing pearls, which he sold.

If only more oysters produced gems, he thought, Mikimoto would be rich.

He knew that for centuries the Chinese had inserted tiny tin and lead statues into shellfish. In time some of the figures were coated with a pearl-like substance.

Mr. Mikimoto and his wife began to place bits of shell and sand in oysters. The first few years produced only two poor pearls.

After 23 years Mikimoto produced pearls in 1913 that could not be distinguished from natural ones except by X-ray.

Now let's go back to the diver at the beginning of the story. The oysters she deposits in the wooden tubs are taken immediately to a "pearl plant." Other girls insert tiny "seeds"—pellets of fresh-water mussel shell.

The oysters are put in cages and lowered into calm bay waters, out of reach of eels, starfish, and octopuses. Twice a year they are raised for checkups.

Finally, at age seven, the oysters are taken out and opened. One in 20 yields a valuable pearl. The pellet of mussel shell had irritated the oyster. The oyster had secreted nacre to "wall off" the itch and a gem was born.

Mr. Mikimoto dreamed of giving every woman the chance to wear pearls. The work of Kazuko and her co-workers brings his dreams closer to realization. L.B.

NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH BAYLOR ROBERTS

NECKLACES for women of the world are the harvest of pearl farms.

In browsing through the first two issues of the new *School Bulletin,* I was pleased to notice that two paintings by Louis Agassiz Fuertes had been reproduced. One shows noblemen and ladies of medieval England hunting with falcons. In the other, prairie chickens and the extinct heath hen—accurate to the last detail—display their beauty.

The name Fuertes may be new to you, but he was a great artist-naturalist of an earlier generation. Biology teachers have told me they regard his paintings of birds and animals as still the best available. He was a great teacher himself, having passed his knowledge and love of wildlife to many a student. He inspired and encouraged Roger Tory Peterson and Arthur A. Allen, outstanding ornithologists.

Dr. Allen recently told me, "Fuertes has never been surpassed as a portrait painter of birds. My work owes a great deal to him."*

Life is a continuous process of teaching or being taught, of learning from the past or passing on knowledge to the future.

Louis Agassiz Fuertes himself received a wonderful gift from the past—his given name. The original Louis Agassiz, giant pioneer of modern naturalists, was so admired by Fuertes's father that he named his son for him in 1874.

Agassiz, born in Switzerland, came to the United States in 1846 and became a citizen in 1861. It was his researches, writing, and teaching that opened American eyes to the importance and delight of natural history study. He marked the beginning of a new era in American education.

On his 50th birthday, surrounded by colleagues, students, and admirers at a special dinner, Agassiz heard his devotion to nature praised by the poet Longfellow in these stanzas:

And Nature, the old nurse, took
The child upon her knee,
Saying: "Here is a story-book
Thy Father has written for thee."

"Come, wander with me," she said,
"Into regions yet untrod;
And read what is still unread
In the manuscripts of God."

And he wandered away and away
With Nature, the dear old nurse,
Who sang to him night and day
The rhymes of the universe.

And whenever the way seemed long,
Or his heart began to fail,
She would sing a more wonderful song,
Or tell a more marvellous tale.

*Arthur A. Allen's *Stalking Birds with Color Camera,* 328 pages, has been reprinted by popular demand, $7.50. Many Louis Agassiz Fuertes paintings illustrate another National Geographic book, *Wild Animals of North America,* 400 pages, $7.75.

LOOK AROUND

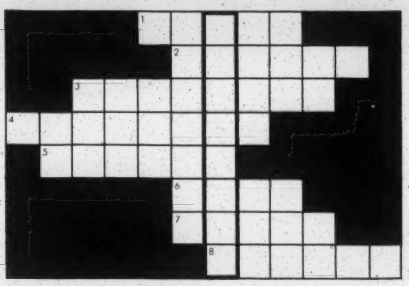
EVER SEE a **squirrel** bury an acorn? It's a show that you can watch in your own neighborhood. Look closely this time of year when squirrels are busy storing acorns and nuts to last them through the winter. You will see a squirrel dart out from a tree, pick a spot and start digging. He buries the acorn three or four inches in the ground, and covers it carefully so that another squirrel will not steal it.

GEORGE F. MOBLEY

When hunger brings him back he remembers exactly where he buried the acorn. Even if the ground is covered with snow he digs right down to it. He takes it out of the hole, cuts a ring around its shell with his razor-sharp teeth, and enjoys a midwinter meal.

GEO-GRAPH

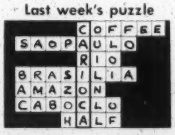
Solve the key word (heavy outline) to learn the type of pearls raised on "farms." All words are used in the story on pearls, pages 44-45.



ACROSS

1. Secretion of the oyster that forms pearls
2. Pellets of_____shell are placed inside the oyster to act as a pearl "seed"
3. Pearl jewelry in one of its common forms
4. Japanese founder of pearl farming
5. Heart of the pearl farming industry is on the island of_____
6. What is used to distinguish between natural pearls and those produced on a "farm"?
7. Age at which the oyster is opened and the pearl removed
8. Women_____ bring the pearl-bearing oysters to the surface

Last week's puzzle



Ill Winds Blow Some Good

It is hard to think of the wind as a friend when it howls about us in hurricane season. But most of the year the wind is a great help to man.

Life would not be possible in many parts of the world without it. The wind distributes the heat of the tropics to other parts of the world. It takes moisture from the sea and waters the continents with it.

"In a windless world," says Dr. Harry Wexler of the United States Weather Bureau, "the tropics would become intolerably hot and the rest of the planet unbearably cold. The parched continents would become dust; cities would suffocate."

If all the winds of the world should suddenly die, it would take more power than all the power plants in the United States could generate in a hundred years to start them up again.

Where does all this almost limitless power come from? The sun heats the surface of the earth. Hot air rises, as you know if you have ever held your hand over a campfire.

The heat of the sun produces strange wind patterns. At the seashore the sun warms the land faster than the water. The hot air over land rises rapidly, sucking in the cooler air over the ocean. That is why the breeze blows in from the sea in the daytime. At night the ground cools faster than the water. The breeze turns around and blows to sea.

Winds race over the sea, but over land they strike mountains and become twisted in forests and cities. They gather up sand, dust, bacteria, and chemicals that are spewed into the air by factories.

The air piles up in towering mountains, forming high pressure areas.

In other parts of the earth's atmosphere troughs form in the air. Here the pressure is low, and the air moves upward. It cools off at higher altitudes, and its moisture condenses into fog or clouds.

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Helium Protects Well-Traveled Declaration of Independence

The Declaration of Independence, America's first statement of freedom, is splendidly housed—today.

You can see it in the National Archives Building in Washington, D. C., where it is protected by every possible means.

But for 150 years the Declaration was the most handled, the most traveled, and the most abused of America's state papers.

It is now faded and discolored. Most of the signatures can't be read. Yet these scars have their own meaning. They tell of perils survived by the document that changed the history of the world, the parchment that proclaimed these "self-evident" truths:

"That all men are created equal . . . endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the Pursuit of Happiness."

Contrary to popular belief, the Declaration, adopted on July 4, 1776, was not signed that day. Not until August 2, 1776, was the parchment copy ready.

NATIONAL BUREAU OF STANDARDS

Technician prevents further damage by sealing the Declaration in glass

As Congress moved about the country to escape the British, the document went along in a "light wagon."

It didn't reach Washington until 1800. In 1812, the British threatened again, and the priceless parchment was hidden in a barn in Virginia.

The worst damage, oddly enough, came in peace time. Much of the loss of ink is blamed on a copy plate made in 1820 by a wet-printing process.

Sunlight and the seasonal heat damaged the document as well. For 35 years it was hung before a window in the Patent Office. In 1876, it was lent to Philadelphia for the celebration of its 100th birthday.

When it was returned, it was displayed in the State Department.

By this time, people began to worry about the Declaration. In 1894, the State Department removed it from public display and stored it in a steel case.

In 1924 it was taken out and installed in the Library of Congress. Eventually, more protection was added by sealing the parchment in an airless case containing helium gas.

Until 1952, the Declaration remained in the Library of Congress—except for three World War II years it spent in Fort Knox, Kentucky.

Then it was installed in its special case in the Archives (above) for all to read its stirring words: "When in the course of human events . . ."

NATIONAL GEOGRAPHIC School Bulletin

. . . from the School Service Division

Published each week during the school year by the National Geographic Society. Melville Bell Grosvenor, President.

October 23, 1961 **Vol. 40, No. 4**

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. . . and other features

Editor—Ralph Gray

Assistants—Arthur P. Miller Jr., Frank Sartwell, Katherine Crapster, Liva Baker, William Goolrick

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NEXT WEEK—
Sahara's Rugged Tibesti

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